THE DOMINANT WEEDS IN INTENSIVE ORCHARDS

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Abstract
The main prerequisite for the proper and timely implementation of measures of weed control and their suppression is the knowledge of their basic biological characteristics. Therefore, the aim of this study was floristic and taxonomic analysis, and also analysis of the biological characteristics of the dominant weeds in intensive orchards, which are cultivated according to the principles of conventional agricultural production, around the Irig village (Vojvodina Province, Serbia). It was identified a total of 18 weed species. Classes Magnoliopsida and Liliopsida are preset with 83.33% and 16.67% species, respectively. In the analyzed weed flora were recorded the presence of 16 invasive species for Europe and 4 invasive species for the Vojvodina Province. The largest number of species are weed-ruderal plants (50.00%), followed by ruderal weeds (22.22%).Majority of the analyzed weed species bloomed from June to September. The biological spectrum of the flora indicates the dominance of theropytes (T - 61.10%).

Introduction
Natural conditions in Serbia are extremely favorable for growing fruit [1].Serbia is one of the few countries, that at a relatively small area, has favorable environmental conditions for the cultivation of all continental species of fruit trees [1, 2].Fruits are a food of high nutritional value and significant raw material for different products. Fruit growing also allows a rational use of agricultural land. A larger area under the fruit trees positively influences to the microclimate of the place and prevents soil erosion on slopes.
However, one of the biggest problems in agricultural production is a control of weeds. The weeds in orchards inflict great damage during production. Their presence significantly reduces the yield and impairs the quality of the fruit. In intensive production, the aim is to destroy weeds or at least brought them into the balance with the crop [3].The composition of weeds in orchards is varied making it difficult to correct choice of herbicides for their control.Great influence on the efficiency of most herbicides have climatic factors.Better results are obtained under conditions of higher soil moisture and pre-treated soil [4].The basic prerequisite for the choice of appropriate measures of weed control is the knowledge of the biological and ecological characteristics of weeds [5, 6, 7, 8, 9].Therefore, the aim of this study was floristic and taxonomic analysis, and also analysis of basic biological characteristics of the dominant weed species in the orchards around the Irig village (Vojvodina Province, Serbia), cultivated according to the principles of conventional agriculture.

Experimental
Investigation of weed flora in intensive orchards of plums, peaches and apricots, were carried out during the vegetation period 2013-2014, around the Irig village ((Vojvodina Province, Serbia). Weed species were determined according to standard identification keys[10, 11, 12, 13]. The taxonomic affiliation of species is according to [14]. Characterization of invasive species for Europe and for Vojvodina Province are according to [15]and [16]. The categorization of weeds by habitat type is according to [17], and for a species *Consolida*

regalis Gray according to [18]. Time of flowering is according to [17], and for a species *Consolida regalis* Gray according to [19]. Life forms are according to [20].

Investigation area

Irig village (45°10' 19°86') is located in the north of the Republic of Serbia, in terms of moderate continental climate. Summers are very hot, with a lack of moisture, and winters are long and harsh. Autumn and spring are moderately warm and short [21]. The average air temperature is 10.9 °C.

Results and discussion

In the weed flora of intensive orchards was identified a total of 18 species.All weeds are included into the phylum Magnoliophyta (11 families, 10 orders, 8 superorders, 7 subclasses and 2 classes),Tab. 1. The greatest number of weeds belongs to the class Magnoliopsida (83.33%). The most common are the representatives of the family Asteraceae (27.78%) and Poaceae (16.67%). In the analyzed weed flora were recorded the presence of 16 invasive species for the Europe (88.88%) according to [15]. Four species (22.22%) are invasive for the Vojvodina Province [16]: *Amaranthus retroflexus* L., *Consolida regalis* Gray, *Panicum crus-galli* L. and *Stenactis annua* L. (Tab. 1). Considering on the huge problems that invasive weed species do to grown plants, it is necessary constantly monitoring of their numbers which is very important in order to prevent their uncontrolled proliferation. Special attention must be paid to adventitious and cosmopolitan weeds because their intensive spread makes a big problems on grown plants and native species in general [22].The largest number of weed species belongs to weed-ruderal plants (50.00%), followed by ruderal (22.22%) and segetal weed species (16.67%).The least number of species belong to meadow weeds (11.11%),Tab. 1.Majority of the analyzed weed species bloomed from June (VI) to September (IX), Tab. 1.The longest flowering period has *Capsella bursa-pastoris* (L.) Medik. (IV-XI). The shortest flowering period have *Rubus caesius* L., *Panicum crus-galli* L. and *Calamagrostis epigeios* (L.) Roth.The biological spectrum indicates on the therophytic character of the weed flora (therophytes - 61.10%),Tab. 1.The most abundant are therophytes T_4, i.e. annuals plants which germinate in the Spring, with the maturing at the end of Summer (33.33%). Geophytes (22.22%) and hemicryptophytes (16.67%) are also recorded. Similar results were obtained by [3].The domination of therophytes indicates on instability of weed community due to the intensive agro-technical measures in the investigated agroecosystem[23, 5].

Conclusion

Investigetion of weed flora in intensive orchards around Irig village, cultivated according to the principles of conventional agriculture, it was found a total of 18 weed species. Sixteen species are invasive for Europe and four for Vojvodin Province. All species are included into phylum Magnoliophyta (class Magnoliopsida - 83.33% and class Liliopsida - 16.67%). The most common are the representatives of the family Asteraceae (27.78%).Majority of the analyzed weed species belongs to weed-ruderal plants (50.00%). The greatest number of recorded weed species bloomed from June to September. The study weed flora shows the therophytic character (T - 61.10%) with prevalence of annual plants that germinate in the Spring, with the maturing at the end of Summer (T_4 - 33.33%).

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Table 1. The dominant weed species in intensive orchards with categorization according to the habitat, time of flowering and life forms (Irig village, Serbia)

Phylum	Class	Subclass	Superorder	Order	Familia	Plant species	Categorization according to the habitat	Time of flowering	Life form
Magnoliophyta	**Magnoliopsida**	Ranunculidae	Ranunculanae	Ranunculales	Ranunculaceae	***Consolida regalis* Gray ***	S	V-IX	T_2
				Papaverales	Papaveraceae	*Papaver rhoeas* L. *	S	V-VI	T_2
		Caryophyllidae	Caryophyllanae	Caryophyllales	Amaranthaceae	***Amaranthus retroflexus* L. ***	KR	VI-IX	T_4
					Chenopodiaceae	*Chenopodium album* L. *	KR	VI-XI	T_4
			Polygonanae	Polygonales	Polygonaceae	*Polygonum aviculare* L. *	R, KR	V-X	T_4
		Rosidae	Rosanae	Rosales	Rosaceae	*Rubus caesius* L.	KR	V	H_3
		Asteridae	Asteranae	Asterales	Asteraceae	*Artemisia vulgaris* L. *	R, LK, ŠK	VII-IX	H_5
						Erigeron canadensis L. *	R	VI-X	T_4
						Cirsium arvense (L.) Scop. *	KR	VI-VII	G_3
						***Stenactis annua* L. ***	R	VI-X	T_4
						Taraxacum officinale L. *	KR, LK	IV-IX	H_3
		Dilleniidae	Capparanae	Capparales	Brassicaceae	*Capsella bursa-pastoris* (L.) Medik. *	KR	IV-XI	T_1
						Sinapis arvensis L. *	KR	V-IX	T_3
		Lamiidae	Lamianae	Solanales	Convolvulaceae	*Convolvulus arvensis* L. *	KR	VI-IX	G_3
				Lamiales	Lamiaceae	*Mentha arvensis* L. *	LK, ŠK	VI-IX	G_2
	Liliopsida	Commelinidae	Poanae	Poales	Poaceae	*Bromus commutatus* Schrad. *	KR	V-VI	T_2
						Calamagrostis epigeios (L.) Roth.	LK, ŠK	VII	G_1
						***Panicum crus-galli* L. ***	S	VI	T_4
Σ	**2**	**7**	**8**	**10**	**11**	**18**			

Legend: *- invasive species for the Europe; bold - invasive species for the Vojvodina Province; Legend: KR - weed-ruderal plant; R – ruderal weed; LK – meadow weed; ŠK – forest weed; S – segetal weed; I-XII – month; T – therophyte; G – geophyte; H - hemicryptophyte

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